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Notes upon Peronosporæ for 1891.

BYRON D. HALSTED.

The season now closing has been an average one as to the total amount of rainfall, but the two previous years were moderately wet ones, and particularly 1889. Of special note in this connection is the amount of rain that fell during the month of August, namely, 5.32 inches on an average throughout the state; while the September precipitation was not so great but near the average.

PHYTOPHTHORA INFESTANS D. By. While not one quarter as prevalent as last year this rot has not been absent, especially among the late potatoes. It was first observed in July, about ten days after a series of rains. The writer is more than ever convinced that much of the decay of Irish potatoes in the East is due to bacteria and the Phytophthora gets credit for much more damage than is its due.

SCLEROSPORA GRAMINICOLA (Sacc.) Schr. which is common upon *Setaria viridis* and *S. Italica* in Iowa, has not yet been found in New Jersey. The first host for this mildew gives one of the best illustrations of how the sustaining tissue breaks up into fine shreds as if to facilitate the dispersion of the oospores as it doubtless does.

PLASMOPARA VITICOLA (B. & C.) Ber. & De T. was comparatively rare upon the grape during the early part of the year, but after the crop was removed the mildew showed itself upon the mature leaves in remarkable abundance. So rapid and great was its growth in September that the vineyardists frequently mentioned the fact of their own accord. This seems to be a striking example of the mildew being associated with the moist weather of the autumn. It has been again observed that the lower leaves, that is, those nearest the soil, are the most certain to be attacked, leaves lying upon the earth being worst of all. It has not been as abundant upon *Ampelopsis quinquefolia* and *A. tricuspidata* as last year.

PLASMOPARA PYGMÆA (Ung.) Schræt. was found in small quantity in early spring upon *Anemone nemorosa* but not met with upon its other hosts.

PLASMOPARA GERANII (Peck) Berl. was in early spring one of our most abundant and conspicuous members of the group, as upon *Geranium Carolinianum* it covered the leaves with a

white felt and developed a premature reddening of the affected foliage. In midsummer it disappeared only to appear again upon the seedling plants in autumn ready for its hibernation in the substance of its hosts. It was taken also upon *G. maculatum* but not upon *G. Robertianum*.

BREMIA LACTUCÆ Reg. has only been met with upon garden lettuce and principally in green-houses where it did some damage.

PERONOSPORA PARASITICA D. By. is one of the most widespread and common of all the mildews. It has been observed on nearly all the ordinary hosts, as *Cardamine hirsuta* and *C. laciniata* in early spring, and radish and cabbage later in the season. A new host apparently in *Alyssum maritimum* was found affected, growing in a green-house with radishes near by, likewise infested. The Cruciferæ in general are subject to the attacks of this mildew.

PERONOSPORA CUBENSIS B. & C. has been the most interesting species this season. It will be recalled that this mildew, in the spring of 1889, was known only in Japan, Cuba and this state. During that year it was found in the southern states. Last year it was only rarely met with, but almost daily looked for. Until midsummer of the present season it had not been found, but since then it has appeared, literally almost everywhere in this region, and through correspondence it is learned that it is very wide spread and general. From Professor Galloway I learn that it is abundant in Washington, and Dr. Sturgis sent specimens from New Haven, where it was common upon watermelon. Upon the same host it seems accountable for the failure of the crop to some extent in this vicinity. No oospores have been met with, but the rapid germination of the violet conidia by zoospores is easily demonstrated. The wild species of Cucurbitaceæ, namely, *Sicyos angulata* and *Echinocystis lobata*, have been examined with the hope of finding the mildew, but without success.

PERONOSPORA EFFUSA Rabh. has been much more abundant this season than formerly. The crop of spinach now standing in some places is badly spotted with the mildew, which will materially shorten the crop.

PERONOSPORA POTENTILLÆ D. By. has been taken occasionally upon the common host *Potentilla Norvegica*, but of most interest is the finding of it upon *P. grandiflora* which,

while recorded in Saccardo, is perhaps new to this country. The oospores were in abundance. It was also luxuriant upon *Potentilla Nepalensis*, in which also oospores were present.

CYSTOPUS IPOMÆÆ-PANDURATÆ Farl. has been abundant upon the sweet potato foliage and the oospores in the galls of the *Ipomæa pandurata* as mentioned last season. In no case were the galls found upon the former host.

CYSTOPUS CANDIDUS (Pers.) Lév. has its long list of hosts, and in this is a match for *Peronospora parasitica*, both frequently growing together upon the same species of Cruciferæ. Fine specimens with chalky white patches of large size were found unusually abundant upon some horseradish plants, and in this vicinity during June the shepherd's purse is fortunately quite seriously affected by this white mold.

CYSTOPUS PORTULACÆ (DC.) Lév. in like manner assists materially in killing off the purslane.

As a whole this has been a year in which the mid-season was characterized by few *Peronosporæ*, but the quota has been well filled by the rapid development of several species in great abundance late in the season. The frosts of autumn held off unusually late, and this, together with the heavy rains, gave these parasites a good opportunity to make a rank growth. The other points of particular interest have been the finding of *Peronospora parasitica* upon *Alyssum maritimum*; *P. Cubensis* in great abundance upon cucumber, pumpkin and squash, and quite destructive to watermelons; *P. effusa* abundant upon spinach; and *P. Potentillæ* upon *Potentilla grandiflora* and *Potentilla Nepalensis*, both hosts abounding in oospores.

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New plants collected by W. G. Wright in western Mexico.

B. L. ROBINSON.

Ayenia Wrightii.—Fruticose: branches terete, smooth: leaves ovate, acuminate, rounded at the base, serrate, glabrous on both sides, a little paler beneath, $1\frac{1}{2}$ –2 inches long, half as wide; some much smaller leaves, 4–6 lines in length, fascicled together with the flowers in the axils of the larger